FOSSIL PIONEERS:
The Chesapeake Region and the Early History of Paleontology in North America
by Michael D. Gottfried, Curator of Paleontology, Calvert Marine Museum

This great region, which once formed the bed of an ancient ocean, and has risen by means of those elevatory forces which have acted upon all the continents, contains beneath its surface unquestioned records of the epochs when its materials were deposited. (Joseph C. G. Kennedy, 1850, “Sketch of the Geology of Maryland,” p. 15)

Paleontology, the study of fossils, is often called a historical science because it deals with the past history of life on Earth. Paleontology is also a branch of the sciences with a long and significant history of its own, and whose beginnings on this continent were an important aspect of early explorations into the natural history of North America.

Fossils have long been known from the region around Chesapeake Bay. Remains of marine life from the mid-Miocene (ten to twenty million years old) are especially significant. During this period, a shallow sea covered our area, reaching as far inland as present-day Washington, D.C., and Richmond, Virginia. The Miocene deposits contain fossil whales, dolphins, seals, sea turtles, crocodiles, seabirds, fishes, sharks, and a variety of shellfish, along with occasional finds of land animals such as peccaries and horses. A representative sample of local Miocene fossils is on exhibit at the Calvert Marine Museum.

Fossils from the Chesapeake Bay region, particularly those of Miocene age, played a significant role in the historical development of paleontology as a science in North America. The reasons for this include the extraordinary richness and accessibility of the local deposits, which attracted the attention of pioneer naturalists, and the proximity of these rich deposits to Philadelphia, the first center of scientific activity in North America. As a result of these factors, some of the important early records of fossils from this continent are based on specimens from the Chesapeake area that were collected and studied by the leading natural historians of the day.

Fossils from the Chesapeake Bay region actually enter into the story before the onset of European exploration and colonization of the Americas. The earliest known local fossil collectors were the Algonquin Indians, who used fossil sharks teeth as scrapers and projectile points (an early sort of applied paleontology), and also for trade. A Miocene Great White Shark tooth apparently modified for use as a scraper by the Patuxent Algonquins can be seen in our “Maritime Patuxent” exhibit.

Written observations on the geology of our region date back to 1608, when the famous explorer and early Virginia colonist Captain John Smith commented on the geologic makeup and shells

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MUSEUM AREA CODE: On November 1 the telephone area code for the museum is expected to change to 410. (Watch newspapers for any change in this date. The museum’s telephone number — 326-2042 — will remain unchanged.
TWO NEW CMM BOOKS AVAILABLE THIS FALL

Two museum research associates authors have been busy in recent months with the final preparations for the appearance of their books this fall. David C. Holly’s book, Tidewater by Steamboat: A Saga of the Chesapeake: The Weems Line on the Patuxent, Potomac, and Rappahannock, is scheduled to appear in November; Geoffrey Marsh Footner’s book, The Last Generation: A History of a Chesapeake Shipbuilding Family, will appear in late October. Both books have been produced through support from the Calvert Marine Museum Press.

Soon after David Holly’s book, Steamboat on the Chesapeake: Emma Giles and the Tolchester Line, appeared in 1987, then-director Ralph Eshelman approached him with the idea of researching the history of the Weems Steamboat Line from its beginning in 1819 until it was sold to the Pennsylvania Railroad in 1905. David Holly agreed, and he spent a full year in extensive research on the book, including interviews with members of the family. A book manuscript was produced by 1989. Discussions with potential publishers developed considerable interest, resulting in the selection of the Johns Hopkins University Press as publisher in association with the Calvert Marine Museum Press. The book will be produced and marketed by Hopkins, with support for basic production costs provided by CMM. It is included in the fall catalogue from Hopkins with a full-page description.

Tidewater by Steamboat recreates the period of the nineteenth and early twentieth centuries during which the steamboat was the predominant mode of transportation in Tidewater Maryland and Virginia—essential to the economy of those counties bordering on the bay and its rivers. One of the most significant companies involved in steamboat transportation, particularly for the Patuxent, Potomac, and Rappahannock rivers, was the Weems Line founded by Captain George Weems and continued by members of the Weems family until the line was sold in 1905. David Holly has used original documents in writing about this important enterprise, documenting its history and the technological changes over the years in steam vessels on the bay, as well as the effects of wars and depressions. He describes well the very significant role of steamboats in the economic and social history of the Tidewater area. Thirteen line drawings and fifty-eight black and white photographs illustrate this 352-page book.

(See the calendar in this issue for information about a booksigning and talk by David Holly at the museum on November 23.)

Geoffrey Footner was similarly challenged by Ralph Eshelman into research on the history of the M. M. Davis Shipyard and the Davis family. Even before his work had crystallized into plans for a book, Geoffrey contributed articles to the Bugeye Times on the Davis shipyard. (See issues for winter 1985/1986, summer 1986, winter 1986/1987, and summer 1987.) As his research took him to both sides of the continent, with hours spent in the libraries and archives of the Mystic Seaport Museum, Maryland Historical Society, Mariners’ Museum in Newport News, New York Yacht Club, the U.S. National Archives, and the U.S. Coast Guard — to mention just a few — Geoffrey Footner became more and more impressed with the broader significance of what had been thought of as just a local shipbuilding company. He realized the importance of the competence of the shipwrights of the Davis enterprise as well as of a management that was able to adapt to the decline of oystering in the bay, to prosper from the challenges of two world wars, and in the 1920s and 1930s to move from commercial vessels into the growing market for custom-built pleasure craft. Changes and growth continued after World War II, but the demand for fiberglass boats eventually caused the demise of a shipyard that had a tradition of building wooden boats of high quality.

Geoffrey Footner’s book is being published entirely by the Calvert Marine Museum Press, with additional substantial financial support from Davis family members and private donors. This 208-page book is illustrated with one color photograph and over eighty black-and-white photographs, including some by notable maritime photographers Morris Rosenfeld, Edwin Levick, A. Aubrey Bodine, and Frank A. Moorshead, Jr.

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C. Douglass Alves, Jr., Director
Paul L. Berry, Editor
Other contributors to this issue:
Layne Bergin, Craig DeTample,
Sue Hamilton, Rita Adams

The bugeye was the traditional sailing craft of the Bay, and was built in all its glory at Solomons, the “Bugeye Capital of the World.” Membership dues are used to fund special museum projects, programs, and printing of this newsletter. Address comments and membership applications to:
Calvert Marine Society, Inc.
P.O. Box 97
Solomons, MD 20688
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Photo by Paula Johnson

Geoffrey M. Footner

Photo by Paula Johnson
CURATOR OF MARITIME HISTORY APPOINTED

Richard J. Dodds has been appointed CMM’s curator of maritime history to fill the position of Paula Johnson who resigned last December. Mr. Dodds began his work at CMM on August 5.

Richard Dodds comes to CMM from the Chesapeake Bay Maritime Museum in St. Michaels where he was museum curator. A native of England, Mr. Dodds holds degrees from Colgate University (B.A.), the University of Rhode Island (Master of Marine Affairs), and the University of Delaware (M.A. in history). After serving in the United States Navy from 1976 until 1982, he completed his education and then joined the Chesapeake Bay Maritime Museum in 1984. Richard Dodds is a member of the American Association of Museums, the National Maritime Historical Society, the United States Naval Reserve, and serves on the Maryland Advisory Board of the National Historical Publications and Records Commission. He has written a number of articles on maritime subjects. The curator of maritime history, one of the five curators at Calvert Marine Museum, is responsible for the collections and programs relating to the museum’s maritime history theme, including the small watercraft. He also is responsible for the archival, photographic, and library collections. Since the maritime history exhibit is already in place in the new exhibition building, Richard Dodds plans to concentrate his attention in the near future on the organization, storage, and conservation of the maritime history collections, and on sprucing up some of the older maritime exhibits. Mr. Dodds’s office is located in the museum’s North Annex until the renovation of the Administration Building.

THE ESTUARIUM: A PROGRESS REPORT

Articles in earlier issues of the Bugeye Times have mentioned plans to open the new estuarium this fall. This is still the hope of the museum staff, although a firm date has not yet been set. An exhibit of this complexity, involving live specimens and unusual technology (much of it behind the scenes), is more difficult to bring to a point where it can be opened to the public.

This exhibit, entitled “Estuary Patuxent: A River and Its Life,” will display in a series of aquariums the aquatic plants and animals to be found in the Chesapeake Bay and along the Patuxent River, beginning with a large tank displaying fish of the open bay and ending with a simulated tidal marsh of the upper river. In between are tanks displaying oyster reefs, submerged aquatic vegetation, salt marshes, and creek environments, along with feature and hands-on touch tanks. Interspersed with the tanks are graphic panels explaining the habitats, their fauna and flora, their ecological roles, and current problems relating to pollution. Entrance to the estuarium will be through a temporary passageway starting from the temporary exhibit room that opened with the building in January 1989. This passageway is located within the area which will eventually house the museum’s third major exhibit, on the geology and paleontology of our region. During the next few years — until the paleontology exhibit is completed — visitors will have the added benefit of watching the preparation and installation of the exhibit “A Window in Time: Maryland in the Miocene” on the way to the estuarium.

When “Estuary Patuxent” is opened late this year, it will not be entirely finished, since funding is still needed for its completion. We shall initially open about half of the aquariums, with the remainder opening in the spring. The otter exhibit will follow approximately one year later. CMS members were recently advised of the grant from the state of Maryland in the amount of $150,000 that can be applied to the completion of the estuarium and the planning work for the paleontology exhibit. This grant requires a match of a comparable amount of which some $75,000 was raised prior to the solicitation to CMS members in early September. Your response to that solicitation has been most encouraging and appreciated: within the first two weeks, some $48,000 has been received. The success of the MARYLAND MATCH campaign will assure visitors an increasingly valuable experience when they come to the museum: first, the estuarium, and, in a few years, an entirely new exhibit on geology and fossils. Museum society members will be advised through a separate mailing of the opening of “Estuary Patuxent.” We hope to see you there.
This summer forty children took part in the Patuxent Environmental and Maritime History Programs sponsored by the Town Creek Foundation. Participants ranged in age from seven to twelve. Instructors Sue Hamilton, Laurie Dowell, and Robin DeBosky were very grateful for the invaluable assistance of aides Corey Watts, Court Britt, and Sterling Britt.

A paleontology excursion on June 29 took sixteen youngsters to Flag Ponds Park to search for fossils. They later returned to the classroom to share their discoveries, to make notebooks, and to create pictures from fossil shells.

Two two-day programs provided introductions to fresh-and salt-water marshes, and two four-day sessions concentrated on the issue of “Pollution and the Bay.” Each day the group participated in some hands-on scientific investigation, created a craft, and played a different game which introduced ecological concepts. The highlight of the longer program was a trip with Captain Jack Russell on the skipjack Dee of St. Mary’s for an afternoon of oyster dredging. Captain Russell gave each youngster the opportunity to enjoy fresh raw oysters and cooked blue crabs.
The Lady Maryland visited CMM several times this summer. Photo by Craig DeTample

Lighthouse cruises conducted by Ross Holland (see page 6) aboard the Wm. B. Tennison were popular activities. Photo by Richard Roming

Members of the Patuxent Small Craft Guild participating in the first "Fun Row" from CMM to the Lore Oyster House, July 30. Photo by Craig DeTample
of the Calvert Cliffs. In 1636, Samuel Maverick noted that buried shells and whale bones had been found along the James River in Virginia, about sixty miles upriver from Chesapeake Bay. Some fifty years later, an English clergyman named John Banister was known to have gathered together some large (presumably fossil) bones and teeth found in Virginia. The exact nature of these discoveries is unknown, and it is not clear whether all of them were fossils in the current sense of the word, or included remains of more recent age.

An important figure in the early study of fossil shells from North America was Martin Lister, who in 1687 and 1688 published drawings of a fossil scallop and clam from Virginia (these shells were Pliocene in age, a bit younger than the Miocene beds of southern Maryland). In 1770, an illustration of the fossil snail Ephora from the Miocene of Maryland was published as part of the series of publications begun by Lister.

The first definitive written record of fossil vertebrates from this general area dates back to the following statement by Catesby in 1743 (Vol. II, appendix, p. vii):

> All parts of Virginia, at the Distance of Sixty Miles, or more, [from the sea] abound in Fossil Shells of various Kinds, which in Strataums lie embedded a great Depth in the Earth, in the Banks of Rivers and other Places, among which are frequently found the Vertibras [sic], and other Bones of Sea Animals.

It is worth noting that, up to this time, the word “fossil” was used in reference to any object dug up from the ground, including rocks and minerals. This original meaning dates back to Aristotle—it was not until the early 1800s that the word fossil was unambiguously used in reference to prehistoric remains or traces of something once living.

These early paleontological observations, although intriguing, did not follow the formal procedures for recording scientific observations or describing new discoveries. The beginning of the scientific study of fossils in North America is often taken as beginning in 1799 when Caspar Wistar (a medical doctor and anatomist in Philadelphia) published a careful, detailed description of Ice Age ground-sloth bones that had been gathered together by none other than Thomas Jefferson (Jefferson’s many pursuits included a keen interest in natural history, although he did not personally collect fossils). Wistar was the curator and later president of the American Philosophical Society in Philadelphia, the birthplace of scientific research in the new nation and site of the earliest important fossil collection.

Among the publications from this period is a description of Maryland’s coastal plain geology written by William Maclure in 1809. Maclure mentioned the presence of fossils from what we now know to be Miocene age deposits, and included an early geologic map. His observations were used by another early geologist, H. H. Hayden, who in 1820 proposed that the “alluvial” beds of the Atlantic coastal plain had been deposited by an enormous flood that had come from the north and covered the area. Hayden’s ideas fit in with the then current notion of “Catastrophism,” which held that sudden cataclysmic events had occurred at regular past intervals in the Earth’s relatively brief history. The opposing viewpoint, “Uniformitarianism,” maintained that the same natural forces that affect the Earth today could be invoked to explain past geological events, and that they had acted consistently over immense periods of time—in other words, “the present is the key to the past.” The main proponent of uniformitarianism was the great English geologist Sir Charles Lyell (about whom more below).

The first few decades of the 1800s saw a number of formal scientific descriptions of fossil shells from the Miocene of Maryland, starting with the work of Thomas Say in 1824. Say described shells that had been collected by John Finch, who (also in 1824) had recorded some geological notes on Maryland. Finch’s collection was eventually deposited in the British Museum of Natural History in London. Among Say’s observations was an interesting and still pertinent passage relating to the fine preservation of the Miocene shells (1824, p. 124):

> Many of these shells appear to the eye nearly as perfect, in every respect, with the exception of color, as the recent ones of the coast, and not a few of the bivalves have both valves attached... circumstances which indicate an undisturbed deposition from the waters in which they had lived.

The year 1828 saw a short but important paper by three early naturalists, Samuel Mitchell, J. A. Smith, and W. Cooper, who discussed the first fossil walrus skull ever found, and also mentioned the presence of “Lamantin” or “Manati” (manatee or sea cow) bones, all from Accomac County, Virginia (southern Delmarva peninsula).
These remains probably dated from the Pleistocene (Ice Ages). Significantly, Mitchill and his co-authors were able to distinguish fossil remains from two of the major groups of marine mammals, and they also noted that fossil walruses had once existed far to the south of their current range in Arctic waters. Mitchill was an important figure in that he was the main founder of the Lyceum of Natural History in New York City, which existed before the American Museum of Natural History. New York was the second-leading center for natural history (after Philadelphia) in North America at the time.

Timothy A. Conrad, paleontologist with the New York Survey, was the most prolific of the early American paleontologists with an interest in the Chesapeake region. Beginning in 1830, Conrad wrote over thirty scientific papers describing fossil shells; many of these publications included Maryland specimens. Conrad, who was responsible for naming many new fossil species, was active as both a collector and a researcher and was one of the most important of the early scientific paleontologists in North America.

In 1842, Richard Harlan published the first formal scientific description of a vertebrate fossil from the Chesapeake area. The specimen was a fossil dolphin skull and associated vertebrae, collected in 1841 from the Calvert Cliffs by Francis Markoe, Jr., with the help of the ever industrious Timothy A. Conrad (Markoe was corresponding secretary of the National Institute in Washington, D.C., which was established before the Smithsonian). Harlan, a medical doctor, was the first American to give scientific names to vertebrate fossils (beginning in 1824)—a Calvert Cliffs dolphin was therefore among the very first fossil vertebrates to be formally described from North America. Harlan gave the fossil dolphin the name Delphinus calvertensis. The name was changed, first to Pontoporia calvertensis (in 1866), and then to Lophocetus calvertensis (in 1867), by Edward Drinker Cope (Cope will be discussed in a future article). The following quote is taken from the introduction to Harlan's description, and is typical of the style of writing in scientific publications of that period (Harlan, 1842, p. 195):

"This interesting fossil consists of the skull, nearly complete, densely petrified, very weighty, tinged of a deep, black, ferruginous color... Its discovery is due to the active researches of Mr. Francis Markoe, Jun., who obtained it from the Calvert cliffs, on the right bank of the Chesapeake bay, State of Maryland, along with other characteristic fossils.... Many other osteological remains, of an interesting kind, have recently been obtained by Mr. Markoe from the same locality.... On comparison with the numerous species of living dolphins, it is found distinct from all of them.... It is unique hitherto in America."

Sir Charles Lyell (mentioned above), the most famous geologist of his day, published two papers in 1845 that discussed the Miocene geology and fossils of Maryland. The interest of such a renowned scientist helped focus even more attention on the fossils and geology of the Chesapeake region. Among Lyell's important contributions was his clear reasoning as to why the fossils in question were Miocene in age, and his comparison of the local deposits and fossils to similar strata and remains in Europe. Fifteen years earlier, Lyell's classic treatise Principles of Geology had had a profound impact on a young naturalist named Charles Darwin.

The year 1850 is an appropriate point to choose as the close of the pioneering period in North American paleontology. By 1850, the work of such pioneers as Harlan, Conrad, and Lyell, and their contemporaries and predecessors, had established a solid foundation for the work of later paleontologists. Since 1850, many of the major figures in paleontology and some of the leading natural history institutions in North America have been closely associated with Chesapeake region fossils. Their continuing story will be told in a future article.

References

A large number of sources were consulted in gathering information for this article. Two of the most important, and which combined contain references to all of the works cited in this article, are:


SOUTHERN MARYLAND SHIPCARVERS' GUILD

This CMM club will begin its new year on September 21, with meetings at the Woodworking/Model Shop from 10:00 a.m. until noon on the first and third Saturdays of each month. Members enjoy a fascinating world of beautiful woods, carving tools, patterns, and—most importantly—mastercarver "Pepper" Langley and his son Jimmy who help members create a variety of carvings: models, eagles, duck decoys, and other examples of the carver's art. Those interested should join the club members at the times and place above.

(Elie Mowbray, SMCG Secretary)

CMS MEMBERSHIP RENEWALS

Membership renewals are now sent out quarterly. Three months are grouped together and renewal reminders are sent on October 1, January 1, April 1, and July 1. (For example, August, September, and October renewals are sent on October 1.) Membership in the society runs for one year from renewal date. Your old card will be honored until you receive your new one.

If you have questions, please call Rita Adams in the membership office.

REMEMBER TO VOLUNTEERS

December 31, 1991, is the cut-off date for fulfilling eligibility requirements for Volunteer Council membership. These requirements are: (1) a completed, signed application form; (2) twenty-four hours of service during 1991; (3) participation in the orientation programs; and (4) membership in the Calvert Marine Society.

Although behind-the-scenes positions are available to non-Council volunteers, benefits such as an engraved name badge, twenty-percent discount in the Museum Store, Anchor newsletter, Volunteer Dinner invitation, and opportunities to work with the public are reserved for Volunteer Council members.

Please call Layne Bergin to discuss volunteer participation and make any necessary arrangements.
VOLUNTEER SPOTLIGHT —

F. Ross Holland, Jr.
Lecturer and Board Member

Lighthouse has been enriched by over $1,600, with double that amount expected by season’s end. Ross Holland, CMM Board of Governors’ member and gracious volunteer of his time and knowledge, has earned the spotlight for this issue.

Ross Holland’s interest in lighthouses began during his distinguished career with the National Park Service. In the late 1970s, shortly after accepting a position in Washington, D.C., heading up their Cultural Resources Program for the North Atlantic Region, Ross attended a meeting of the Council of American Maritime Museums (CAMM). His genuine concern with maritime preservation, both the public relations and physical problems, brought demands from CAMM participants. “They proceeded to take out after me,” Ross recalled, and things were “a little heated.”

But a rapport with former Calvert Marine Museum director Ralph Eshelman was established, and Ross continued to attend CAMM meetings regularly.

After retiring from the National Park Service in 1983, Ross devoted time to extensive lighthouse research, the basis of four books, and worked for the Statue of Liberty-Ellis Island Foundation. When that project was completed, Ross was nominated, on Ralph’s suggestion, to CMM’s Board of Governors.

“I try to bring the professional perspective to the situation,” Ross says of his board participation, disclaiming local political knowledge. He commutes from his home in Silver Spring, Maryland, for both his Board of Governors’ duties and his cruise “appearances.”

Even as two more books are readied for publication and speaking engagements accepted, Ross is willing to volunteer with Tennison lighthouse cruises again next year. “There’s going to be an enormous amount of satisfaction in seeing the funds increase” for both the Drum Point Lighthouse and a maintenance fund for the 1899 Tennison, Ross says, adding that it’s just “nice to see the people.”

For information on volunteer opportunities at Calvert Marine Museum, please call Layne Bergin on 326-2042.